



Asia-Pacific
Cycle Congress

17 – 20 October 2017
Christchurch, New Zealand



The road to a better future: is there a role for the bicycle in modern cities?

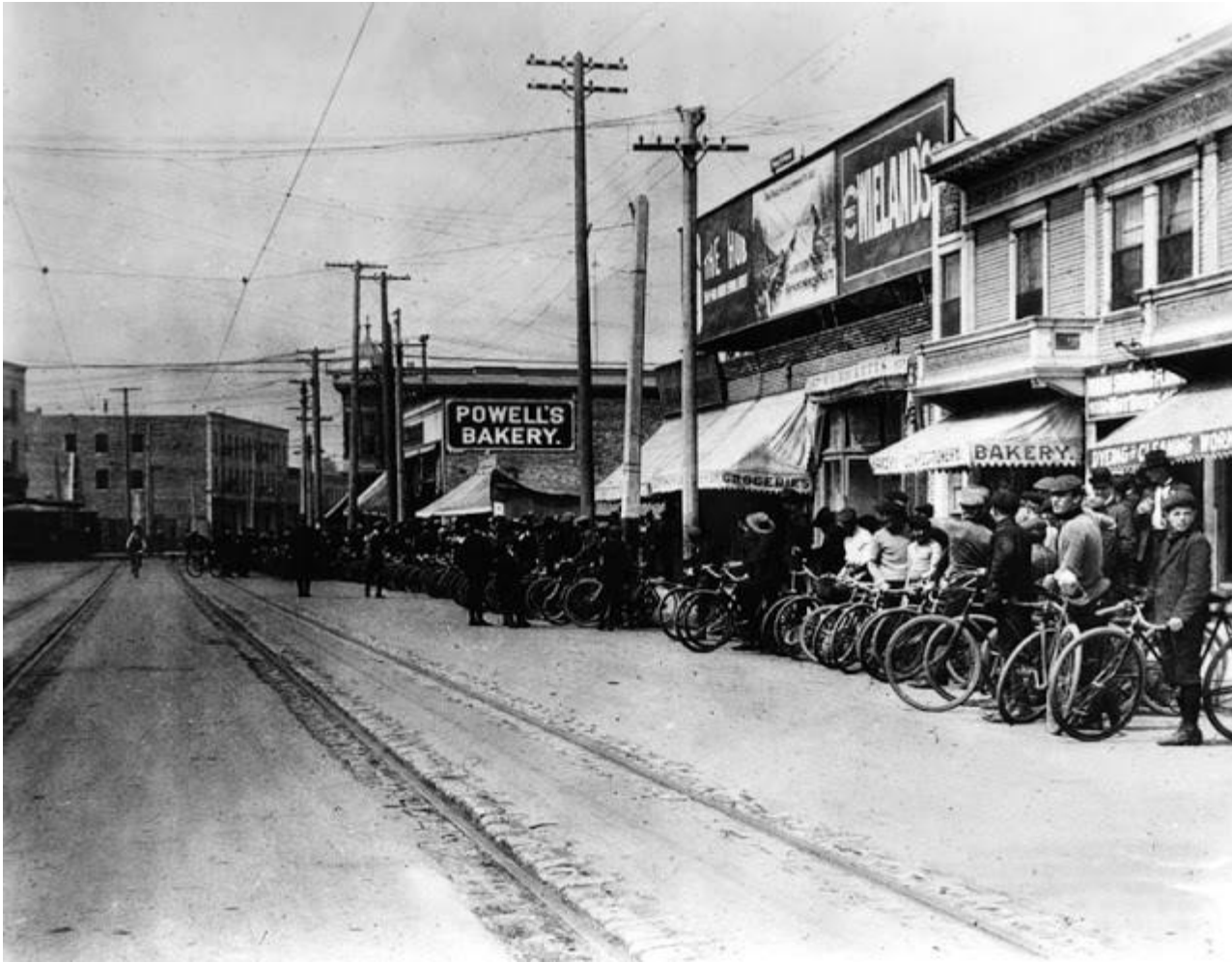
Prof Simon Kingham

Director of the Geospatial Research Institute and the Geohealth Laboratory,
Department of Geography

University of Canterbury - Te Whare Wananga O Waitaha, Christchurch, NZ

The past

Los Angeles



The past

Christchurch



www.teara.govt.nz/en/photograph/23420/christchurch-the-cycling-city



www.my.christchurchcitylibraries.com/image-collection-cyclists/

The past

Wellington



www.radionz.co.nz/collections/cycling/galleries/cycles-past



The past

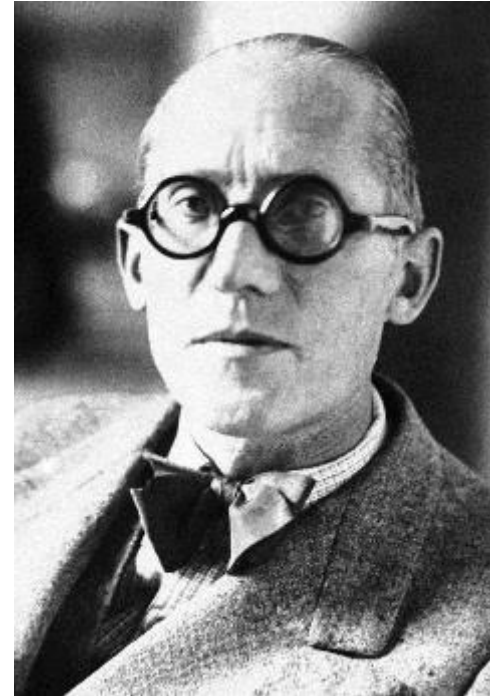
Auckland



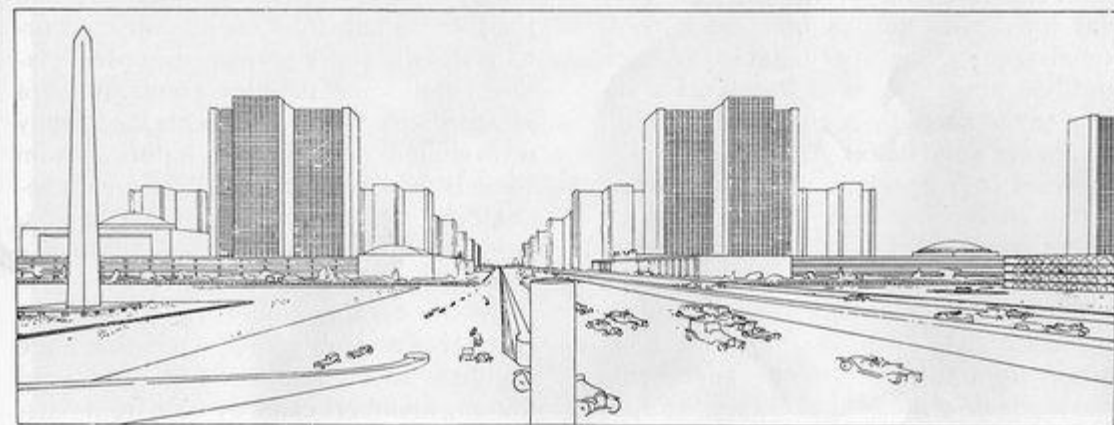
www.bikefriendlynorthshore.wordpress.com/2015/11/04/bikes-are-history/

www.bikeauckland.org.nz/call-for-feedback-for-a-bike-friendly-inner-east/

Visions for cities



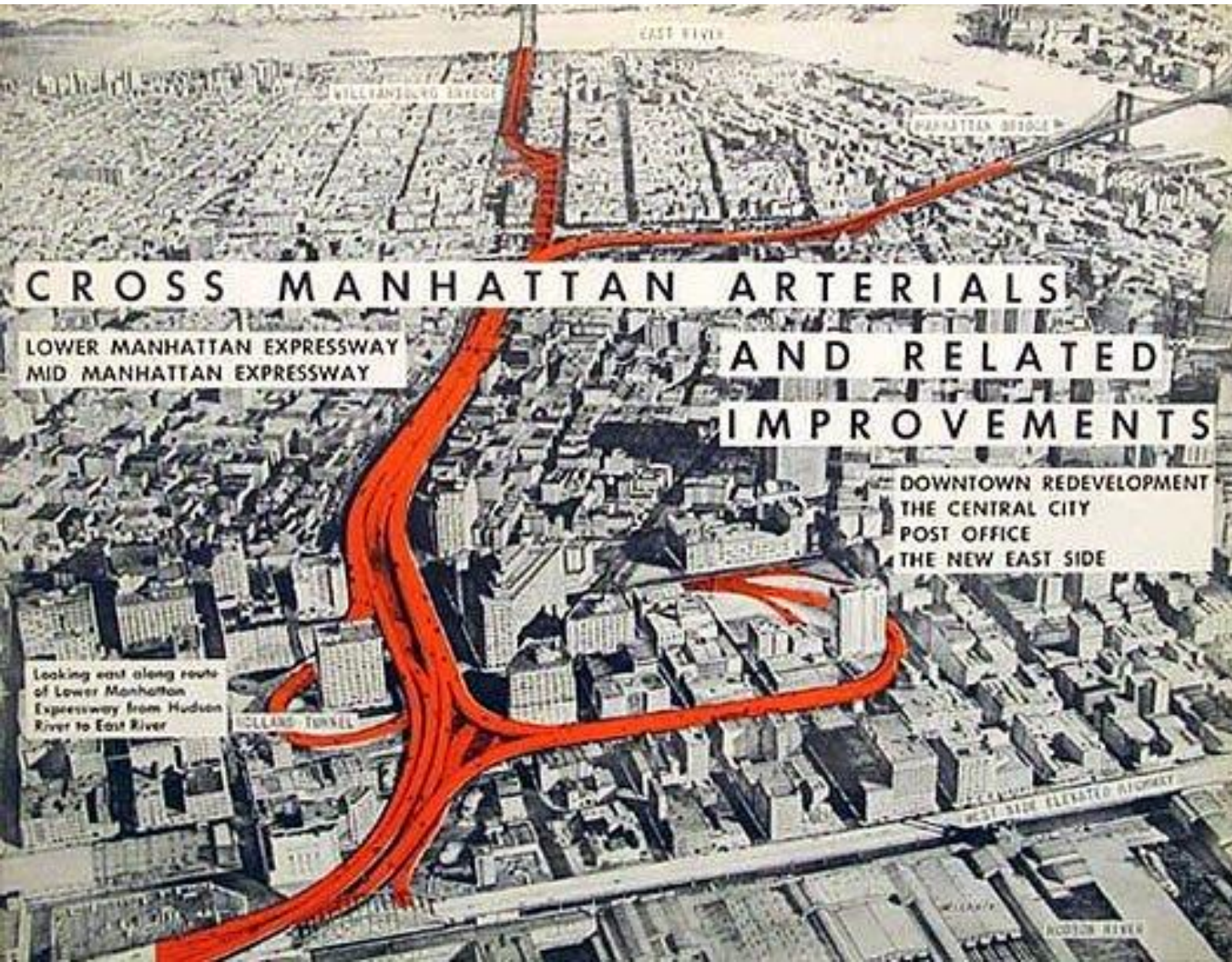
Le Corbusier,
Paris, 1925



Visions for cities



*Robert Moses,
New York, 1950s*



Movie Cities



Metropolis, 1927

Movie Cities

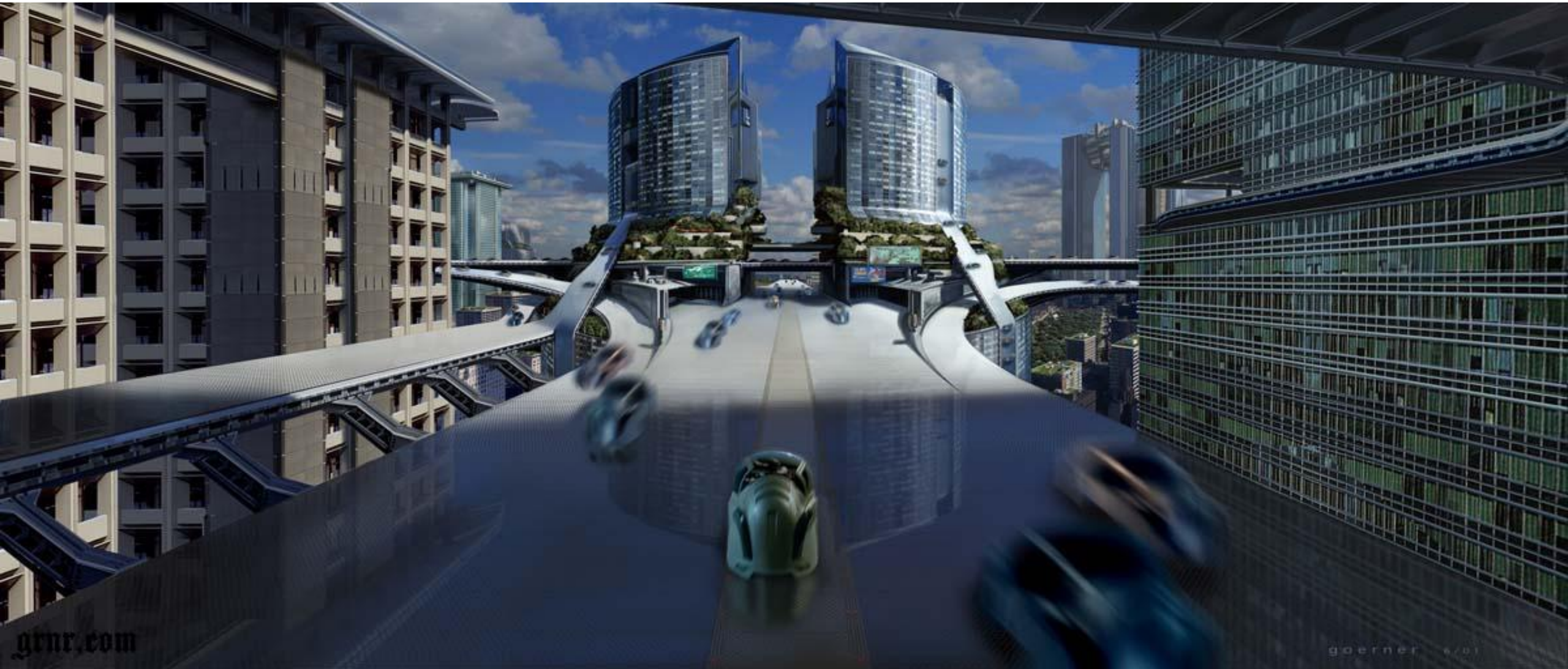


The Fifth Element, 1997



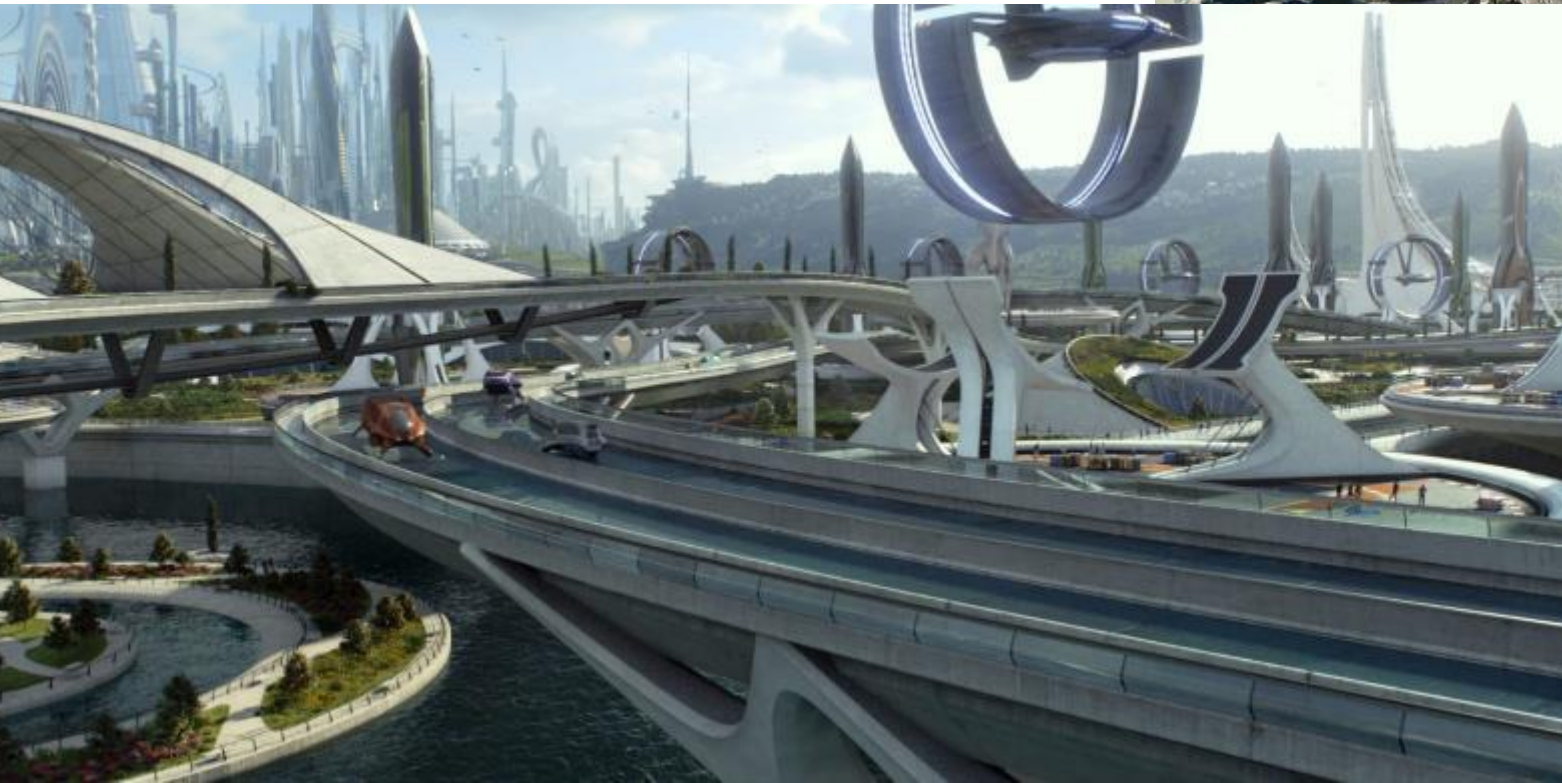
Movie Cities

Minority Report, 2002



Movie Cities

Tomorrowland, 2015



Movie Cities

Wall-E, 2008



The reality



<http://www.stuff.co.nz/the-press/65284370/Christchurchs-most-congested-roads-revealed>

<http://www.stuff.co.nz/motoring/news/88222940/Auckland-slowest-moving-and-most-congested-city-of-its-size-in-Australasia>



<https://www.stuff.co.nz/dominion-post/94423158/solving-wellingtons-congestion-problem-is-no-easy-task>



City challenges

Climate change



TORNADOES

HURRICANES



SEVERE
DROUGHTS



EXTREME
PRECIPITATION
EVENTS



COASTAL
FLOODING



HEAT
WAVES



Limited
Evidence



Strong
Evidence

Strongest
Evidence

The Economic Case for Climate Action in the United States



Bloomberg L.P. (US) | <https://www.bloomberg.com/news/articles/2017-09-27/climate-shock> Search



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Climate Shocks May Cost U.S. \$1 Billion a Day

By **Joe Ryan**

28 September 2017, 5:00 AM NZDT

From **Climate Changed**

<https://feu-us.org/case-for-climate-action-us2/>

Peak oil

<https://www.forbes.com/sites/jamesconca/2017/03/02/no-peak-oil-for-america-or-the-world/>

MAR 2, 2017 @ 06:00 AM 31,960

No Peak Oil For America Or The World



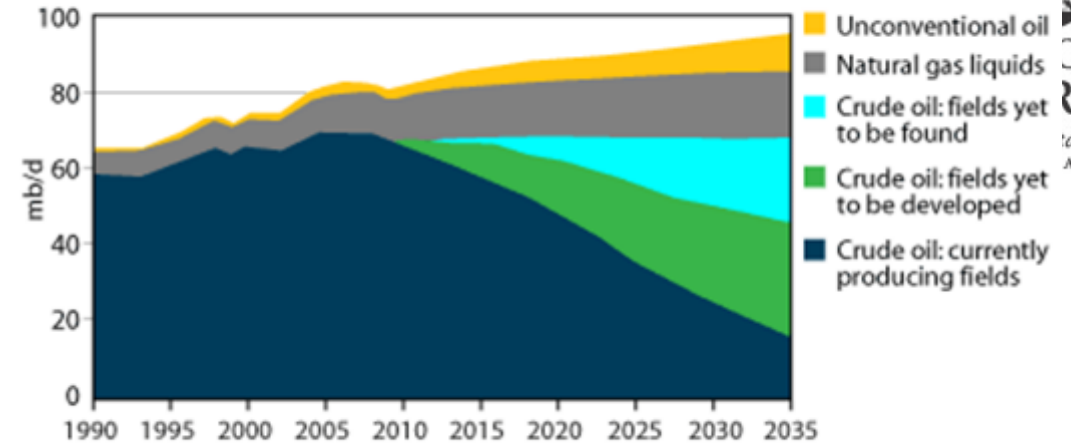
James Conca, CONTRIBUTOR

I write about nuclear, energy and the environment [FULL BIO](#)

Opinions expressed by Forbes Contributors are their own.

Oil is more plentiful than you can imagine. And we keep figuring out easier and more economical ways to get it out of the ground.

Admission of Peak Oil?



Source: IEA, World Energy Outlook 2010

[WWW.AGORAFINANCIAL.COM](http://www.agorafinancial.com)

<http://www.businessinsider.com.au/welcome-peak-oil-2011-1>

oilprice.com/Energy/Crude-Oil/US-Shales-Most-Productive-Play-May-Peak-By-2021.html

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**TSVETANA
PARASKOVA**

Tsvetana is a writer for the U.S.-based Divergente LLC consulting firm with over a decade of

U.S. Shale's Most Productive Play May Peak By 2021

By [Tsvetana Paraskova](#) - Sep 24, 2017, 2:00 PM CDT

Sustainability

<https://www.theguardian.com/cities/2016/jul/12/urban-sprawl-how-cities-grow-change-sustainability-urban-age>

Cities Urban Age at 10

The curse of urban sprawl: how cities grow, and why this has to change

The total area covered by the world's cities is set to triple in the next 40 years - eating up farmland and threatening the planet's sustainability. Ahead of the latest Urban Age conference, Mark Swilling says it is time to stop the sprawl

Cities is supported by



About this content



Mark Swilling

Tuesday 12 July 2016 11:55 BST



Sprawl

THE NEW CLIMATE ECONOMY
The Global Commission on the Economy and Climate

NCE Cities – Sprawl Subsidy Report

ANALYSIS OF PUBLIC POLICIES THAT UNINTENTIONALLY ENCOURAGE AND SUBSIDIZE URBAN SPRAWL

Lead Author: Todd Litman, Victoria Transport Policy Institute

CONTENTS	Page
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The New Climate Economy

The New Climate Economy (NCE) is the flagship project of the Global Commission on the Economy and Climate. It was established by seven countries, Colombia, Ethiopia, Indonesia, Norway, South Korea, Sweden and the United Kingdom, as an independent initiative to examine how countries

Release: urban sprawl costs US economy more than \$1 trillion per year

News Article / March 19, 2015

Washington, DC, March 19th: Urban sprawl costs the American economy more than US\$1 trillion annually, according to a new study by the New Climate Economy. These costs include greater spending on infrastructure, public service delivery and transportation. The study finds that Americans living in sprawled communities directly bear an astounding \$625 billion in extra costs. In addition, all residents and businesses, regardless of where they are located, bear an extra \$400 billion in external costs. Correcting this problem provides an opportunity to increase economic productivity, improve public health



Sprawl

https://www.theguardian.com/world/2017/sep/02/flood-waters-rising-urban-development-climate-change

**Natural
disasters and
extreme
weather**
The Observer

As flood waters rise, is urban sprawl as much to blame as climate change?

Global warming may have intensified Hurricane Harvey and storms in Asia and Africa but the real problem may be our sprawling cities



983 254

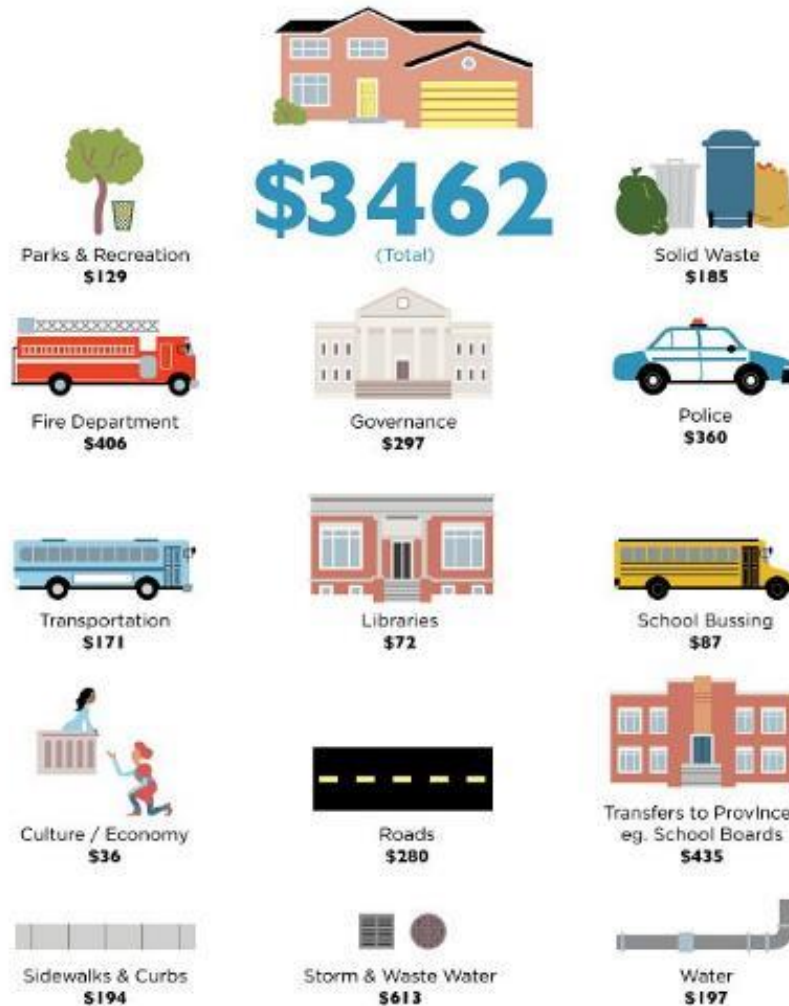
John Vidal

Sunday 3 September 2017
00.04 BST



Infrastructure

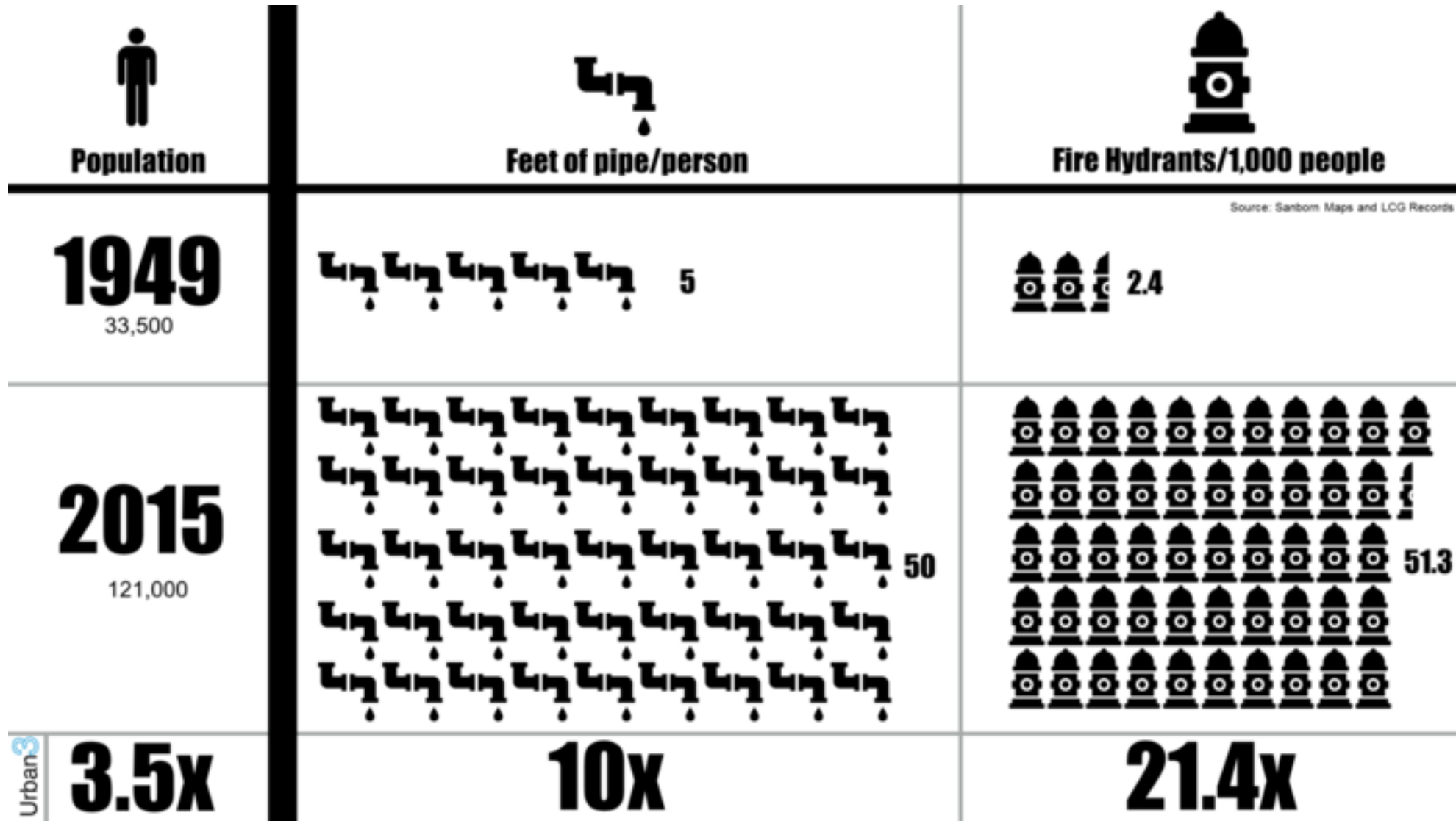
Suburban City's Annual Cost, per Household



Urban City's Annual Cost, per Household



Infrastructure



<https://www.stuff.co.nz/national/health/97797530/new-zealand-gets-bronze-in-oecd-obesity-stakes>

New Zealand retains bronze in OECD obesity stakes

RACHEL THOMAS AND TOM HUNT
Last updated 13:39, October 12 2017



Health

https://www.theguardian.com/society/2017/aug/25/the-obesity-crisis-a-healthy-population-needs-a-healthy-environment

Obesity

The obesity crisis: a healthy population needs a healthy environment

Public Health England is not up to the task, says **Rob Whewey**; we all need to stop eating for winter, says **Cian Foley**; gardening and tai chi can help older people stay fit, says **Louise Ansari**; what priority is the government giving to preserving urban open spaces for pleasant walks, asks **Mark Bryant**



126

Letters

Friday 25 August 2017
19.06 BST



How can the bicycle help?

Obesity

Belfast
Telegraph.co.uk Friday 27 March 2015

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Active commuters 'have lower BMI'

Flint et al, 2014, Associations between active commuting, body fat, and body mass index: population based, cross sectional study in the United Kingdom. BMJ 349, 4887

Obesity

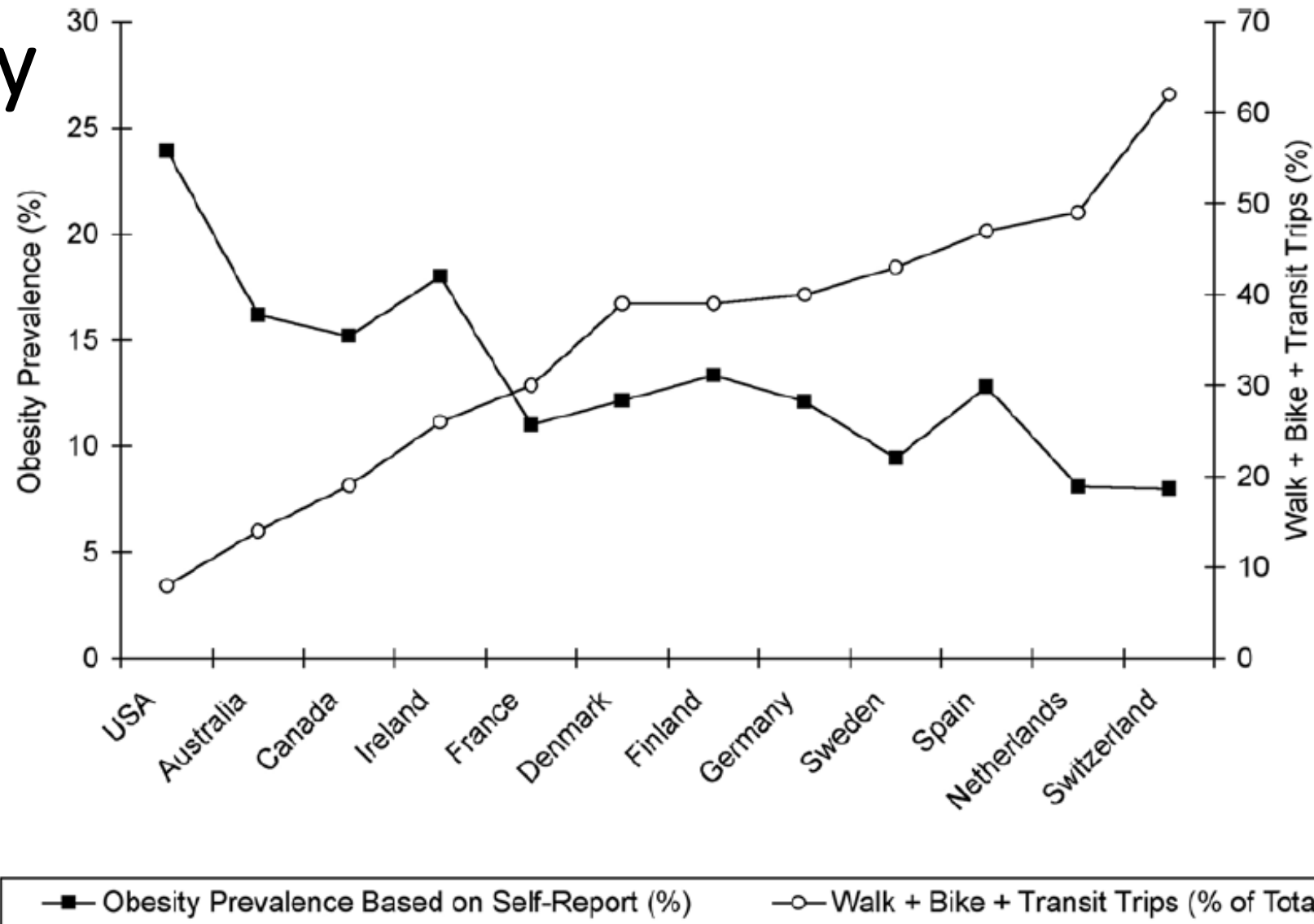


Figure 2 — Obesity ($\text{BMI} \geq 30 \text{ kg} \cdot \text{m}^{-2}$) prevalence and rates of active transportation (defined as the combined percentage of trips taken by walking, bicycling, and public transit) in countries of Europe, North America, and Australia. BMI was computed from self-reported height and weight. Data were obtained from national surveys of travel behavior and health indicators conducted between 1994 and 2006 (see text for details).

Mental health

- Compared to driving, wellbeing was higher when using active travel or public transport.
- Use of active travel reduced the likelihood of two specific GHQ12 psychological symptoms.
- Switching from car driving to active travel improved wellbeing.



Preventive Medicine

Volume 69, December 2014, Pages 296–303



Does active commuting improve psychological wellbeing?
Longitudinal evidence from eighteen waves of the British
Household Panel Survey

Adam Martin^{a, b},  , Yevgeniy Goryakin^{a, b}, , Marc Suhrcke^{a, b, c}, 

Happiness

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Experts ▾

Lifestyle ▾

Tools ▾

Multimedia

W

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04 JUNE 2014

Bicycling the 'happiest' form of transport

A study found that people are in the best mood while they are bicycling, compared to any other mode of transportation.

Longer life



THE INDEPENDENT FRIDAY 27 MARCH 2015

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Football ▾ / Six Nations / Rugby Union ▾ / Cricket / Tennis / Rugby League / Golf / Motor Racing / Racing / Boxir

Sport > Others > Cycling

The secret of eternal youth: skin-tight Lycra and a bicycle

Pollock et al, 2015, An investigation into the relationship between age and physiological function in highly active older adults. The Journal of Physiology 593, 3, 657

Encourage density

<https://www.theguardian.com/society/2017/oct/06/inner-city-living-makes-for-healthier-happier-people-study-finds>

Housing

Inner-city living makes for healthier, happier people, study finds

Residents of higher-density areas are more active, more socially engaged – and less obese – than people who live in the sprawl of suburbia



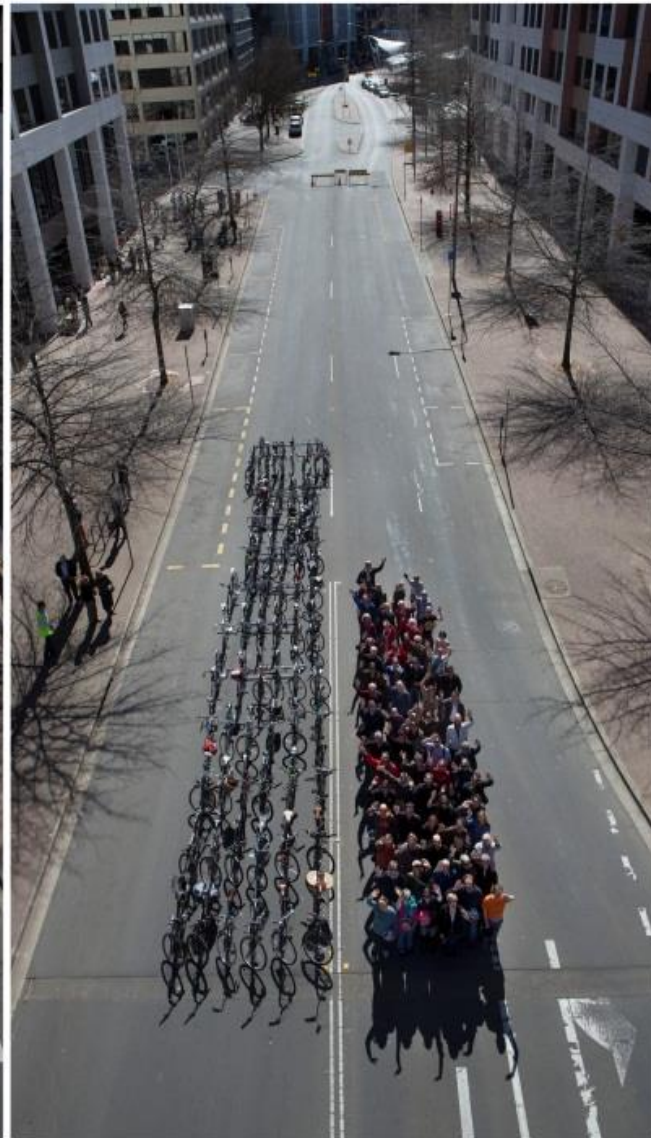
5273 1,194

Reuters

Friday 6 October 2017
01.13 BST



Congestion



Congestion

<https://www.forbes.com/sites/federicoguerrini/2014/10/14/traffic-congestion-costs-americans-124-billion-a-year-report-says/>

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OCT 14, 2014 @ 06:02 AM 18,861

2 Free Issues of Forbes

Traffic Congestion Costs Americans \$124 Billion A Year, Report Says

inrix.com/press-releases/traffic-congestion-cost-uk-motorists-more-than-30-billion-in-2016

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www.radionz.co.nz/news/national/336352/auckland-traffic-congestion-costs-city-almost-2b-a-year



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NEW ZEALAND / TRANSPORT

Auckland traffic congestion costs city almost \$2b a year

PRESS RELEASES

Traffic Congestion Cost UK Motorists More Than £30 Billion in 2016

4:02 pm on 2 August 2017

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Emissions and energy

www.shiftingparadigms.nl/articles/bikes-for-liveable-cities/



Bikes for liveable cities

Using climate finance to facilitate and promote cycling

The transport sector is the fastest growing source of greenhouse gas emissions worldwide. Particularly in emerging countries, increased use of cars is contributing to low air quality, traffic congestion and an increase in greenhouse gas emissions.

- car drivers are consistently exposed to the highest average levels of carbon monoxide and ultrafine particles
- on-road cyclists are exposed to significantly higher levels of CO, PM₁ and UFP than off-road cyclists

Kingham S et al, 2013, Variations in exposure to traffic pollution while travelling by different modes in a low density, less congested city. Environmental Pollution 181, 211-218.



Social capital

Communities that promote sustainable and active can:

- Reduce disparities between the rich and poor
- Promote good neighbourhood
- Enable poor to gain better access to healthy food
- Lead to decreased crime

Source: OECD, 2000, Environmentally sustainable transport. Futures, strategies and best practices.

UC
UNIVERSITY OF
CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND

PROPERTIES CLOSER TO THE MONON TRAIL

PROPERTIES WITHIN 150 FEET OF BIKE PATHS SELL FOR \$8,800 MORE

PROPERTIES CLOSER TO THE MONON TRAIL SELL FOR AN AVERAGE OF 11% MORE

VS

Business owners aren't the only ones who benefit from bicycling: homeowners profit too. A study of house values near the Monon Trail in Indianapolis, IN, measured the impact of the trail on property values. Given two houses of the same size, with the same number of bedrooms and bathrooms, and comparable garages and porches – one within a half mile (800 meters) of the Monon Trail and another farther away – the house closer to the Monon Trail would sell for an average of 11 percent more. A study of property values near trails in Delaware found that properties within 50 meters (150 feet) of bike paths sell for \$8,800 more than similar houses.

At the local level, the economic benefits of bicycling are striking. Add up the impact across an entire state and the results can be staggering. Here are just a few recent studies on the economic impact of biking at the state and provincial level.

IN IOWA, commuter and recreational bicycling generates more than \$400 million in economic activity each year.

IN QUEBEC, the bike industry in the province generated more than \$181 million in sales, supporting 2,800 jobs and generating \$17.2 million in tax revenues for QUEBEC and \$13.6 million in national taxes.

IN WISCONSIN, the bicycle industry contributes \$56 million and 3,418 jobs to the state economy, while recreational riders contribute another \$924 million annually.

IN MINNESOTA, bicyclists spend \$261 million annually, supporting more than 5,000 jobs and helping to generate \$35 million in taxes.

BIKING AND WALKING IN VERMONT CREATED \$41 MILLION IN WAGES

IN VERMONT, biking and walking created at least 1,400 jobs, \$41 million in wages and \$83 million in revenue in 2009.

IN COLORADO, bicycling contributes \$1 billion to the economy from manufacturing, retail, tourism, and bike races, employing 1,213 people with an annual payroll of \$341 million.

BIKES IN COLORADO CONTRIBUTE \$1 BILLION TO THE ECONOMY

BICYCLISTS IN IOWA GENERATE MORE THAN \$400 MILLION IN ECONOMIC ACTIVITY

BICYCLISTS IN MINNESOTA GENERATE \$35 MILLION IN TAXES

CONTRIBUTE \$924 MILLION ANNUALLY

5% INCREASE IN COMMERCIAL VACANCIES ACROSS MANHATTAN

\$

MANHATTAN-WIDE AVERAGE OF JUST 3% INCREASE IN SALES

\$2,145*

SHOPPERS ARRIVING BY CAR IN THE EAST VILLAGE ONLY SPENT

closed

closed

PEDESTRIAN-FRIENDLY REDESIGN WITH CYCLE TRACK RESULTS IN 49% FEWER COMMERCIAL VACANCIES IN UNION SQUARE

BUSINESSES ALONG THE 9TH AVENUE CYCLE TRACK REPORT UP TO 49% INCREASE IN SALES

SHOPPERS ARRIVING BY BIKES IN THE EAST VILLAGE SPENT \$16,485*

Productivity

theguardian

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Cities

Resilient cities

Cities with physically active residents more productive as well as healthier

Increasing amount of green space and promoting walking, cycling and use of public transport has significant economic benefits, study concludes



Advertisement



10k 26

Peter Walker

@peterwalker99

Tuesday 9 June 2015
00:01 PST

Business



NYC Dept of Transportation, Measuring the Street: New Metrics for 21st Century Streets
www.nyc.gov/html/dot/downloads/pdf/2012-10-measuring-the-street.pdf

City liveability

www.eco-business.com/opinion/urban-cycling-initiatives-lead-liveable-cities/



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Urban cycling initiatives lead to liveable cities

By Niels Hoé

Friday 9 May 2014



Overall benefits

- NZ research: *“transforming urban roads over the next 40 years, using best practice physical separation on main roads and bicycle-friendly speed reduction on local streets, would yield benefits 10–25 times greater than costs”* (Macmillan et al, 2014)

Benefit: Costs

Table 3: BCRs of the roads of national significance, 2011

Project	BCR	BCR plus WEBs*
1. Puhoi to Wellsford	0.8	1.1
2. Auckland Western Ring route	2.1	2.7
3. Victoria Park Tunnel	3.2	n/a
4. Waikato Expressway	1.4	1.8
5. Tauranga Eastern Link	1.4	1.8
6. Wellington Northern Corridor	1.1	1.4
7. Christchurch Motorways	2.0	2.4
Simple average (all)	1.7	n/a
Simple average (all except 3.)	1.5	1.9

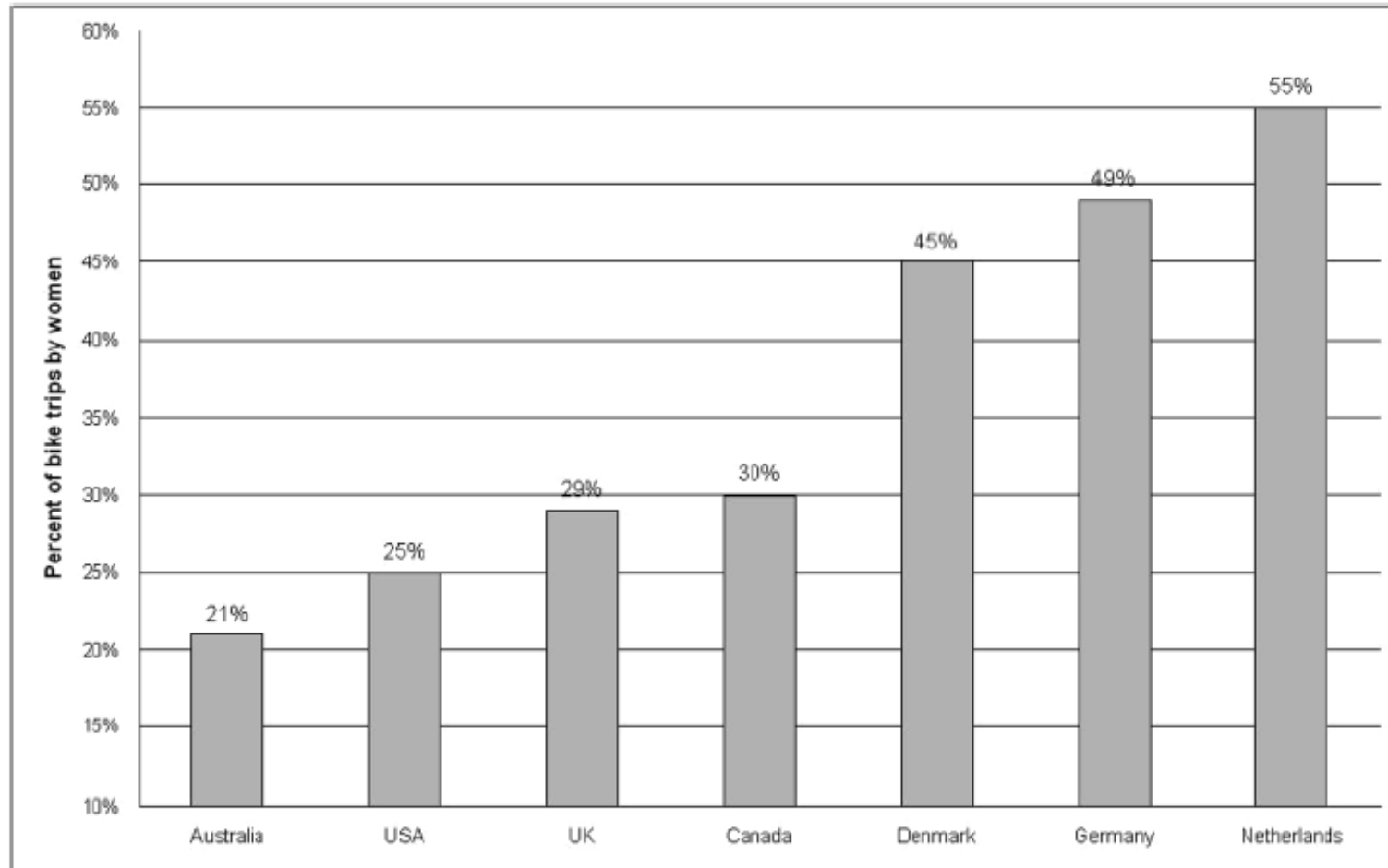
* wider economic benefits

Christchurch Major Cycleways

5.0 – 8.0

- Pickford M, 2013, State highway investment in New Zealand. The decline and fall of economic efficiency. Policy Quarterly 9, 3, 28.
- Christchurch Major Cycleway Routes Updated Funding Assessment. February 2015

Different types of users



Sources: German Federal Ministry of Transport (2003); U.S. Department of Transportation (2003); Danish Ministry of Transport (2005); Statistics Netherlands (2005); Australian Bureau of Statistics (2007); Department for Transport (2007) and information provided directly by bike planners in Canadian provinces and cities

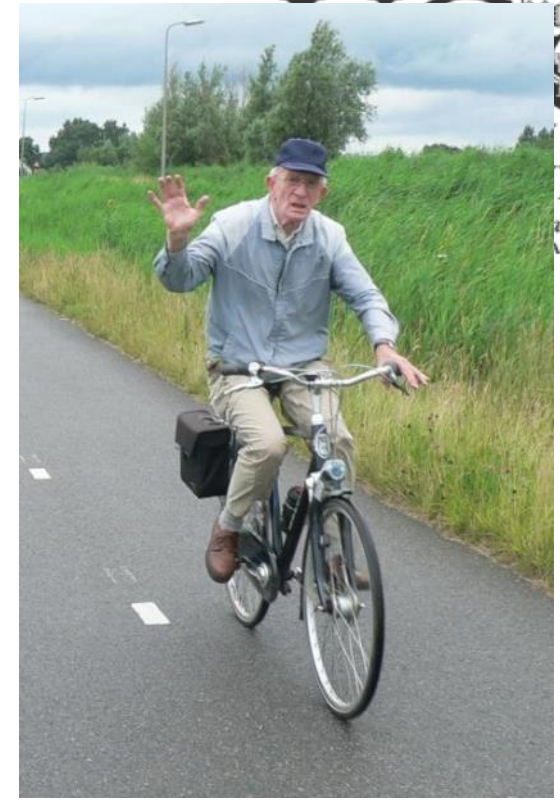
Figure 8. Women's share of total bike trips in Australia, the USA, the UK, Canada, Denmark, Germany and the Netherlands (2000–2005).

Source: Pucher and Buehler. 2008. Making Cycling Irresistible: Lessons from the Netherlands, Denmark and Germany. *Transport Reviews* 28 (4).

Different types of users



Different types of users



Different types of places



Houten (Utrecht), Netherlands

Vathorst (Amersfoort), Netherlands



Different types of places



Bahnstadt, Heidelberg, Germany

Strasbourg, France



What are the barriers?

Barriers to cycling



What do we need to do?

Build it and they will come

If you build it, they will come: New study shows that bike lanes increase ridership



[Lloyd Alter \(@lloydalter\)](#)
[Transportation / Bikes](#)

June 3, 2014

Share on Facebook

Austin, TX: Barton Springs Road

One-way protected bike lane on the south side of the road



Bluebonnet Lane

Two-way protected bike lane on a two-way street



Rio Grande Street

Two-way protected bike lane on one-way street



Monsere et al, 2014 Lessons from the Green Lanes: Evaluating Protected Bike Lanes in the US. NITC Final report NITC-RR-583, June 2014.

What can go wrong?

Bikelash!

06 NEWS

SATURDAY APRIL 26 2014 ADVERTISER.COM.AU

Calls for calm as bike lane backlash gains momentum

The New York Times

N.Y. / Region

WORLD U.S. N.Y. / REGION BUSINESS TECHNOLOGY SCIENCE HEALTH SPORTS OPINION

Expansion of Bike Lanes in City Brings Backlash

www.stuff.co.nz/auckland/local-news/7386703/Anger-as-bike-lanes-replace-car-parks

www.stuff.co.nz/dominion-post/news/65301558/Anger-erupts-online-over-Island-Bay-cycle-lane

stuff

Anger as bike lanes replace car parks

Anger erupts online over Island Bay cycle lane

DUBBY HENRY • 14:08, Aug 01 2012



TALIA CARLISLE

Last updated 13:49, January 22 2015



https://www.stuff.co.nz/the-press/news/94217959/Business-owners-threaten-legal-action-over-Christchurch-cycleway

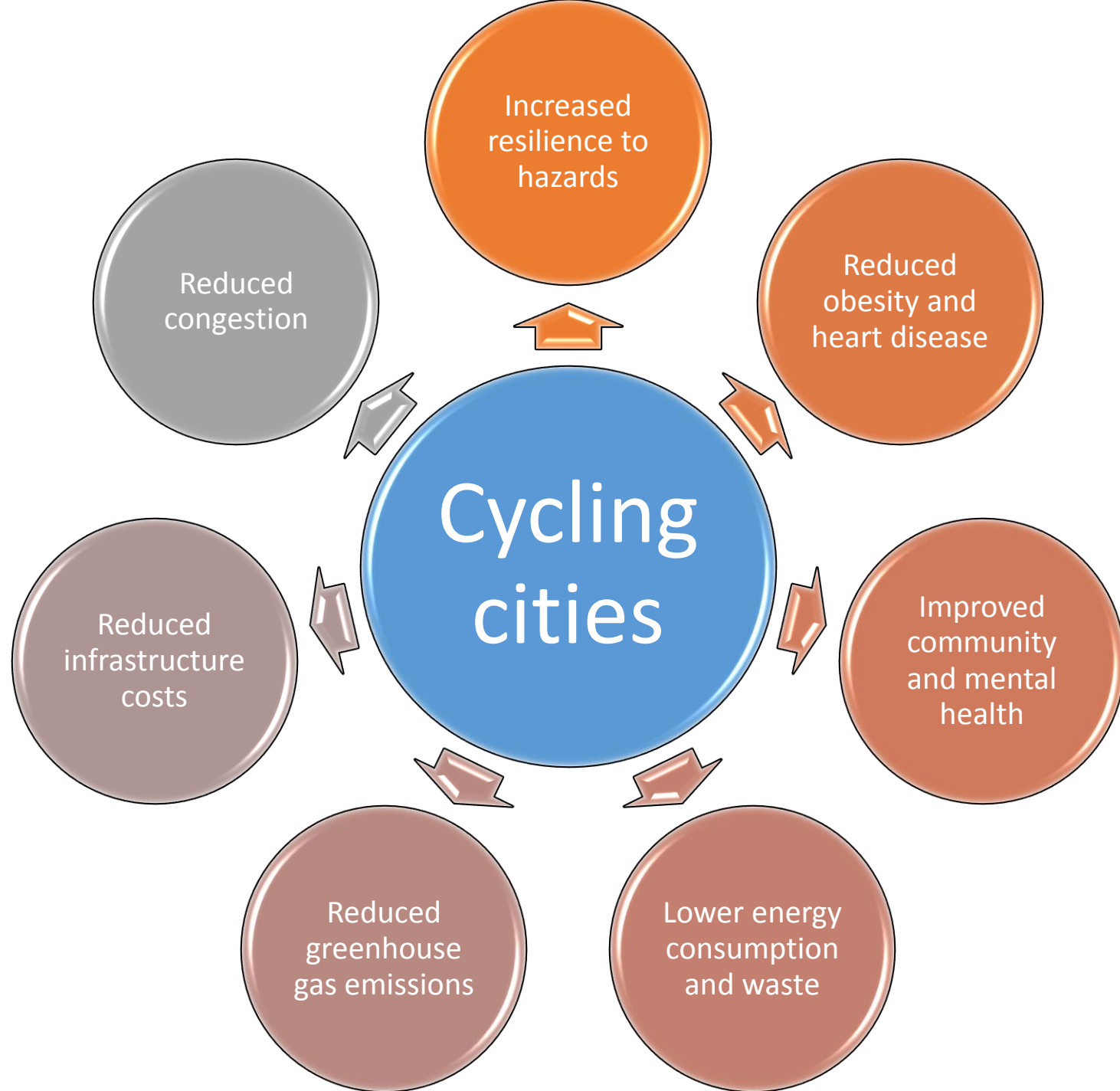
Business owners threaten legal action over Christchurch cycleway

TINA LAW

Last updated 19:31, June 29 2017



What can cycling cities do?



Final thoughts

- Society is facing some major challenges
 - Climate change, peak oil, obesity, community breakdown
- Cycle-friendly cities can address them
- Investing in cycling is very cost effective
- Is there a role for the bicycle in modern cities?
 - Absolutely!
- We know what to do
 - Safe, separated cycle infrastructure
- But bikelash!



Thanks and questions